

GLOSSARY

ACIDITY—A term used to describe the characteristic of a substance as to its capability to give off a hydrogen ion (a proton). An acid is a proton donor. See pH for degree of acidity.

ADSORPTION—The adherence of dissolved, colloidal, or finely divided solids on the surfaces of solid bodies with which they are brought into contact.

AERATION—The bringing about of intimate contact between air and a liquid by one of the following methods: spraying the liquid in the air; bubbling air through the liquid; or by agitation of the liquid to promote surface absorption of air.

AIR AGITATION—The process of agitating sand in a rapid sand filter during the washing by injecting air under low pressure into bottom layers of the sand bed.

AIR BINDING—The clogging of a filter, pipe, or pump due to the presence of entrapped air.

ALGAE—Primitive plants, one or many celled, usually aquatic and capable of elaborating their foodstuffs by photosynthesis.

ALKALINITY—A term used to represent the content of carbonates, bicarbonates, hydroxides, and occasionally borates, silicates, and phosphates in water. It is expressed in parts per million of calcium carbonate.

APPURTENANCES—Machinery, appliances, or auxiliary structures attached to a main structure, but not considered an integral part thereof, for the purpose of enabling it to function; in water systems, the structures, devices, and appliances, other than pipe and conduit, which are used in connection with a water distribution system, such as valves, hydrants, services, corporation cocks, etc.

BACTERIA—Primitive plants, generally free of pigment, which reproduce by dividing in one, two, or three planes. They occur as single cells, groups, chains, or filaments, and do not require light for their life processes.

BLOWOFF—A controlled outlet on a pipeline, tank, or conduit used to discharge water or accumulations of material carried by the water.

CALIBRATION—The process of taking measurements or of making observations to establish the relation between two quantities.

CHLORINATION—The application of chlorine to water, generally for the purpose of disinfection, but

frequently for accomplishing other biological or chemical results.

CLARIFICATION—The process of removing suspended or colloidal matter from a turbid liquid.

CLARITY—A term describing the clearness of water. The absence of suspended matter.

COAGULANT—A material which, when added to water, will combine with certain substances ordinarily present and form a precipitate comprising floc particles more or less gelatinous in character, having the capacity to remove colloids from water.

COAGULATION—

(1) The agglomeration of colloidal or finely divided suspended matter by the addition to the liquid of an appropriate chemical coagulant, by biological processes, or by other means.

(2) The process of adding a coagulant and other necessary reacting chemicals.

COLLOIDS—

(1) Finely divided solids which will not settle but may be removed by coagulation or biochemical action.

(2) In soil physics, a discrete mineral particle less than 2 micrometers in diameter.

(3) A finely divided dispersion of one material called the “dispersed phase” in another called the “dispersion medium.”

CONDENSATION—The process by which a substance changes from a gaseous to a liquid or solid state or condition.

CONTAMINATION—A general term signifying the introduction into water of microorganisms, chemicals, wastes, or sewage, which render the water unfit for its intended use.

CORROSION—The gradual deterioration or destruction of a substance of material by chemical action, frequently induced by electrochemical processes, the action proceeding inward from the surface.

CRENOTHRIX—A genus of bacteria characterized by unbranched attached filaments having a gelatinous sheath in which iron is deposited. They precipitate metallic deposits in pipes, etc., which sometimes color the water. They also, after their death, cause disagreeable taste and odor in the water.

DETERGENT—A cleaning agent which acts like soap, but is more effective on grease and dirt.

DIATOMACEOUS EARTH—(DIATOMITE)—Minute, variously shaped, silica skeletons of diatoms

which were small, single cell marine plants that lived years ago. Diatomaceous earth is often used as a filter medium in swimming pool filters.

DIFFUSER—A porous plate or tube through which air is forced and divided into minute bubbles for diffusion in liquids. Commonly made of carborundum, alundum, or silica sand.

DISCHARGE—

- (1) As applied to a stream, the rate of flow, or volume of water flowing in a stream at a given place and within a given period of time.
- (2) The act involved in water or other liquid passing through an opening or along a conduit or channel.

DISINFECTION—The killing of the larger portion (but not necessarily all) of the harmful and objectionable microorganisms in, or on, a medium by means of chemicals, heat, ultraviolet light, etc.

EFFECTIVE SIZE—An index of grain size of a filter sand. The grain size which is smaller than 90 percent (by weight) of grains in the sand and larger than 10 percent.

EFFLUENT—A liquid which flows out of a containing space, particularly sewage, water or other liquid flowing out of reservoir, basin or treatment plant, or part thereof.

ELECTROLYSIS—A form of corrosion occurring in metallic pipe or metallic structures. It is caused by stray electric currents which pass through the earth or other conductor to the pipe, follow the pipe, and later pass again into the ground, and reach another conductor. Such corrosive action occurs where the current leaves the pipe, and metallic ions in the pipe, induced by the flow of electrical current, enter the soil at that point.

EVAPORATION—The process by which water passes from a liquid state at temperatures below the boiling point to vapor.

EXAMINATION OF WATER—

- (1) Bacterial: Determination of the presence, number, and identification of bacteria.
- (2) Chemical: Determination of character and composition of matter contained in the water.
- (3) Microscopic: The examination of water to determine the type of plant and animal life present, such as algae, diatoms, protozoa, crustacea, etc., as an indicator of the source of the water, pollution by sewage and forms of organic life which may cause objectionable tastes, odors, or appearances, or interfere with filtration.

FILTER—A device or structure for removing solid or colloidal material, usually of a type that cannot be removed by sedimentation, from water, or other liquid.

- (1) Bed: Layers of material in a filter which remove impurities from a liquid or gas that is

passed through.

- (2) Zeolite Filter: Filter used to soften water. Filter medium is zeolite, a substance which will remove calcium and magnesium from water, replacing them with sodium. Does not remove suspended matter from water.

FINES—The finer grained particles of a mass of soil, sand, or gravel.

FLOC—Small gelatinous masses, formed in a liquid by the addition of coagulants thereto or through biochemical processes or by agglomeration.

FLOCCULATION—The formation of floc by use of coagulating chemicals and mechanical agitation.

GAGES—

- (1) Pressure gage: A device for registering the pressure of solids, liquids, or gases. It may be graduated to register pressure in any units desired.
- (2) Recording gage: A gage which makes a continuous record, also called a register.
- (3) Water-level gage: A gage, recording or otherwise, which indicates the water level in a reservoir, still well, or other receptacle.

HARDNESS—A characteristic water chiefly due to the existence therein of the carbonates and sulfates and occasionally the nitrates and chlorides of calcium, iron and magnesium which cause “curdling” of the water when soap is used, an increased consumption of soap, the deposition of scale in boilers, and sometimes objectionable taste in water.

IMPERVIOUS—A term applied to a material through which water cannot pass. Also applied to material through which water passes with great difficulty.

INDICATOR—A chemical which reacts with other chemicals to develop a color which can be identified.

INFILTRATION—

- (1) The flow or movement of water through the interstices or pores of a soil or other porous medium.
- (2) The absorption of water by the soil, either as it falls as precipitation, or from a stream flowing over the surface.

INFLUENT—Sewage, water or other liquid, raw or partly treated, flowing into a reservoir, basin, or treatment plant, or part thereof.

LEPTOSPIROSIS—An infection caused by the organism *Leptospira*.

MICROORGANISM—Minute organism either plant or animal invisible or barely visible to the naked eye.

MURIATIC ACID—A name for hydrochloric acid.

PATHOGENIC—Disease producing.

PERCHLORON—A chloride containing a large amount of chlorine.

PERCOLATION—

- (1) The flow or trickling of a liquid downward through a contact or filtering medium. The liquid

may or may not fill the pores of the medium.

- (2) The movement or flow of water through the interstices or the pores of a soil or other porous medium.

PERMEABILITY—The property of a material which permits appreciable movement of water through it when saturated and actuated by hydrostatic pressure of the magnitude normally encountered in natural subsurface waters.

pH—Measure of hydrogen ion concentration, indicating degree of acidity or alkalinity of a solution. Values below 7.0 indicate acidity and above 7.0 alkalinity.

POLLUTION—The addition of sewage, industrial wastes, or other harmful or objectionable material to water.

POTABLE—Water which does not contain objectionable pollution, contamination, minerals, or infection, and is considered satisfactory for domestic consumption.

P/M—Standard abbreviation for parts per million.

PROTOZOA—Small one-celled animals including amoebae, ciliates, flagellates.

PURIFICATION—The removal by natural or artificial methods, of objectionable matter from water.

RESIDUAL (CHLORINE)—The quantity of chlorine, in excess of the chlorine demand, remaining in water, sewage, or effluents after a selected contact period of time, expressed in parts per million. The difference between the chlorine dose and the chlorine demand.

SEDIMENT—

- (1) Any material carried in suspension by water, which will ultimately settle to the bottom after the water loses velocity.
- (2) Fine waterborne matter deposited or accumulated in beds.

SILICA—Crystalline silicon dioxide (SiO_2)—Quartz.

SILT—

- (1) Soil particles which constitute the physical fraction of a soil between 0.005 mm and 0.05 mm in diameter.
- (2) Fine particles of earth, sand, or soil carried in suspension by flowing water. Sometimes includes material rolled along stream bed.

SLOUGH—To cast off a thin film of scum or a mass of bacterial growth or fungus.

SLUDGE—The accumulated settled solids deposited from sewage or industrial wastes, raw or treated, in tanks or basins, and containing more or less water to form a semiliquid mass.

SLURRY—A thin watery mixture.

SPALLING—A breakaway of concrete in thin layers, caused by water and thermal changes, expanding and loosening the surface layers.

STERILIZATION—The destruction of all living organ-

isms, ordinarily through the agency of heat or of some chemical.

STRAINER, WELL—A special form of slotted or perforated well casing that admits water from an aquifer consisting of unconsolidated granular material, while preventing the granular material from entering the well.

SURGE—A momentary increase in flow (in an open conduit) or pressure (in a closed conduit) which passes longitudinally along the conduit, due usually to sudden changes in velocity.

TUBERCULATION—A condition which develops on the interior of pipelines due to corrosive materials present in the water passing through the pipe and which results in the creation of small hemispherical lumps (tubercles) on the walls of the pipe, which increase the friction loss and, by reducing the velocity, also reduces the capacity of the pipe.

TURBID—Cloudy—not clear.

TURBIDITY—

- (1) A condition of a liquid due to fine visible material in suspension, which may not be of sufficient size to be seen as individual particles by the naked eye but which presents the passage of light through the liquid.
- (2) A measure of fine suspended matter (usually colloidal) in liquids.

VACUUM—Condition existing in a closed space from which all gas, vapor, or other matter has been removed. Commonly applied to a closed space in which pressure is much lower than surrounding atmospheric pressure; any space where negative pressure exists.

VENTURI TUBE—A closed conduit or pipe containing a gradual contraction, which causes a reduction of pressure head, by which the velocity may be determined. The contraction is generally followed, but not necessarily so, by an enlargement to the original size.

VISCOSITY—The cohesive force existing between particles of a fluid which causes the fluid to offer resistance to a relative sliding motion between particles.

WATER HAMMER—The phenomenon of oscillations in the pressure of water in a closed conduit flowing full, which results from a too rapid acceleration or retardation of flow. Momentary pressures greatly in excess of the normal static pressure may be produced in a closed conduit from this phenomenon.

WEIR, MEASURING—Device which measures flow of water. Generally, a thin vertical plate with a rectangular, trapezoidal, triangular, or other shaped notch at the top. Depth of overflow (head) of water flowing through the notch is an index of rate of flow.

SWIMMING POOL OPERATING LOG For use of this form, see TM 5-662; the proponent agency is USACE.			WEEKLY LOG					
			FROM			TO		
INSTALLATION						POOL BLDG NO.		
1. TYPE CHLORINATION		2. TYPE FILTERS		3. NO. OF OPERATING FILTERS			4. AREA OF FILTERS	
ITEMS TO BE CHECKED		SUN	MON	TUE	WED	THU	FRI	SAT
5. CHLORINE RESIDUAL								
6. pH								
7. CHLORINE USED (lbs/hr)								
8. RECIRCULATION RATE (gpm)								
9. PUMPING TIME (minutes)								
10. TOTAL WATER RECIRCULATED (gal.)								
11. DRAINED (yes or no)								
12. VACUUMED (time)								
13. PRESSURE LOSS ON FILTER (lbs.)								
14. BACKWASHED (time-filter No.)								
15. BACKWASH RATE (gpm/sq. ft)								
16. BACKWASH TIME (minutes)								
17. BACKWASH WATER USED (gal.)								
18. OTHER CHEMICALS USED (lbs.)								
19. HAIR CATCHER CLEANED (time)								
20. MAXIMUM BATHING LOAD								
21. ESTIMATE OF TOTAL BATHERS								
22. TIME POOL OPENED								
23. TIME POOL CLOSED								
24. REMARKS (Report any unusual conditions, operating difficulties, change in treatment, equipment repairs, etc.)								
25. APPROVED							26. DATE	

DA FORM 3164-R, SWIMMING POOL OPERATING LOG

INSTRUCTIONS

Item

1. Type chlorination: Enter type of chlorine dosing equipment used, such as gas chlorinator or hypochlorinator.
2. Type Filters: Enter description of filters including type (gravity, pressure, or vacuum) and name of filter media (sand, anthracite, or diatomaceous earth).
3. Number of Operating Filters: Self-explanatory.
4. Area of Filters: Enter total filter area, in square feet, of all operating filters.
5. Chlorine Residual: Enter results of each chlorine residual determination expressed in parts per million to the nearest one-tenth (0.1).
6. pH: Enter pool water pH to the nearest one-tenth (0.1).
7. Chlorine Used (lbs/hi): Enter the average total weight of available chlorine used in pounds per hour during the daily operating period of the chlorination equipment.
8. Recirculation Rate (gal/min): Enter the recirculation rate as the combined actual filtration rate of all operating filters expressed in gallons per minute.
9. Pumping Time (min): Enter the total daily operating time of the recirculation pumps expressed in minutes.
10. Total Water Recirculated (gal): Enter the total daily quantity of water recirculated (pumped) expressed in gallons. This quantity should be the product of items 8 and 9.
11. Drained (Yes or No): State whether the pool was drained (emptied) during the 24-hour period.
12. Vacuumed (time): Enter the time that vacuum cleaning of the pool was performed.
13. Pressure Loss on Filter (lbs): Enter the total pressure loss in the operating filter(s), and the filter numbers, immediately prior to backwashing the filter(s), expressed in pounds per square inch (lb/in²) gage.
14. Backwashed (Time-Filter number): Enter the time that filter(s) were backwashed and the appropriate filter numbers (filter numbers should correspond to those in item 13).
15. Backwash Rate (gal/min/ft): Enter the flow rate used in backwashing the particular filter(s) expressed in gallons per minute per square foot of effective filter area.
16. Backwash Time (min): Enter the time period, in minutes, during which the filter(s) were being backwashed.
17. Backwash Water Used (gal): Enter the total daily amount of water used to backwash filter(s). This quantity should be equal to item 15 multiplied by item 16 multiplied by the total effective filter area of the filters being backwashed.
18. Other Chemicals Used: Enter the name and quantity, in pounds per day, of all other chemicals used in the pool recirculation system, exclusive of chlorine and chlorine compounds.
19. Hair Catcher Cleaned (time): Enter the time that the hair catcher, on the recirculation system, was cleaned.
20. Maximum Bathing Load: Enter the estimated maximum number of bathers in the pool at any one time during the daily pool operating period.
21. Estimate of Total Bathers: Enter the estimated total number of bathers using the pool during the daily pool operating period.
22. Time Pool Opened: Enter the time the pool opened for use. (Express time as 1300 hrs, 1400 hrs, rather than 1:00 p.m. and 2:00 p.m.)
23. Time Pool Closed: Enter the time the pool closed, expressed as specified in item 22.
24. Remarks: Self-explanatory.